AMENDMENTS TO THE SPECIFICATION

Please replace the section entitled "Detailed Description of the Drawings and the Preferred Embodiments Therein," beginning on page 8 of the Application as filed and continuing through page 13, with the following amended paragraphs. A marked up copy showing the changes made has been appended to the end of this amendment. No new matter has been added.

DETAILED DESCRIPTION OF THE DRAWINGS AND THE PREFERRED EMBODIMENTS THEREIN

The device of the current invention is capable of use with a variety of hole and void forming molds, such as hole formers, mandrels, and knock-outs. However, for purposes of the description herein, these and other devices that can be used in mold casting will be collectively referred to as "hole formers." This lexicography should not be seen as limiting the application of the invention to a sole embodiment. Rather, a "hole former" as used in this section refers to any insert to be used in mold casting that would form a hole or void in the final cast member.

Although the hole former is pictured as cylindrical, one skilled in the art would recognize that a hole former can take a variety of different shapes depending on the particular arrangement and eventual pipe attachment that is desired. However, each hole former 32 can be described as having an outer surface 44 and an inner surface 42. The hole former 32 is capped at least at one end with an end cap, while the other end may be left open to provide access to the interior of the hole former. The end cap is preferably contoured in shape to substantially align with the outside of the inner mold form 34 or the inside of the outer mold jacket. If the hole is to be molded all the way through the casting, the opposite end of the hole former 32 should be contoured so that it substantially aligns with the form or jacket wall not matched with the end cap. In other words, the radius of curvature of the contoured ends of the hole former 32 should match the radius of curvature of the surface that it abuts. This prevents the mold material from entering the interior of the hole former 32, thus complicating the removal of the hole former from the hardened casting material 28. In the case of a drainage box however, it should be noted that the hole former end cap and opposite end will be substantially planar, since the radius of curvature for these structures is zero.

The hole former 32 can be made of any suitable plastic, metal, wood, or other material that can be removed from the mold once the casting material 28 has set. The hole former 32 itself is a cylindrically shaped member that may or may not be substantially hollow.

The hole former 32 is provided with an inner hanging support brace. The support brace extends across the diameter of the hole former 32 and attaches to the hole former's inner surface 42. The support brace can be made of any material that is capable of supporting the weight of the hole former 32, such as metal, alloys, wood or plastic. It should be noted that if the hole former 32 is not substantially hollow, the support brace can constitute the whole interior portion of the hole former 32.

A hanging bracket 30 is provided that is attached to the hole former 32. The bracket 30 can be attached by means of a screw, a bolt, a pin insert, or any other means known in the art, so long as it is able to support the weight of the hole former 32. The bracket 30 can attach to the interior or the exterior of the hole former 32. If the bracket 30 is to be attached to the hole former's interior, there can be provided a hole or slot in the hole former 32 through which the bracket 30 can be inserted, in order to gain access to the interior of the hole former 32.

In a preferred embodiment, the hanging bracket 30 fits into a slight recess in the inner mold form. This provides the inner surface of the finished mold with a more uniform and smooth structure. However, the mold form recess is not a necessary aspect of the present invention, and is only presented here as a non-limiting feature.

The hanging bracket 30 extends from the hole former 32 to the edge of the inner mold form's upper surface 36. The bracket 30 is there provided with a first

angle 38. This angle 38 first should match the angle that the surface of the inner wall forms at its intersection with the mold's upper surface 36. While in the present embodiment this is a 90-degree angle, this angle can vary, depending on the shape of the upper surface 36 of the mold. While not meant to be a limitation of the present invention, the bracket 30 works optimally when the bracket angle is set at 90 degrees. In this arrangement, the downward force exerted on the hanging bracket 30 by gravity and the upward force exerted by the hole former's buoyancy during casting pushes entirely against either the upper surface 36, or the magnet assembly 10. At angles other than 90 degrees, buoyancy and gravitational forces would have a vector component that might tend to displace the hole former from its set position in the casting mold.

The bracket 30 extends onto the upper surface 36 of the mold, where a magnet assembly 10 holds the bracket 30 in its predetermined position. The magnet assembly 10 provides a resistant force that prevents any movement of the bracket 30, and therefore also the hole former, during the casting process. Preferably, the magnet assembly 10 is provided with a recess, which is substantially the same depth as the thickness of the hanging bracket 30 with which it interfaces. This allows the bracket 30 to align with the bottom edge of the magnet assembly 10, maximizing the retaining force that the magnet exerts on the bracket 30.

The magnet assembly 10 itself is preferably comprised of a plurality of magnets 12, although any magnet assembly 10 that is capable of retaining the hole former in a stationary location can be used. The plurality of magnets 12 should be arranged in a polar configuration that projects the strongest magnetic field away from the lengthwise surface of the magnets. This should be done in a North to North and South to South arrangement. In this way, the magnetic field generated by each of the magnets is summed together, creating a stronger magnet field that is exerted through the planar surface of the magnet assembly 10. This arrangement thus creates a magnetic field that is stronger than a similarly situated

single magnet. The magnets can be made from any magnetic material, including but not limited to ceramic ferrite, samarium-cobalt, neodymium-iron-boron.

Disposed between the magnets are pole pieces 14 that help to direct the flux of the magnets through the planar face of the magnet assembly 10. This produces a stronger magnetic attraction then could be achieved without the pole pieces 14. This pole piece material can be any material that is known in the art, and should not be seen as a limiting feature of the invention. However, for purposes of completeness, the preferred embodiment utilizes a carbon steel material disposed between the magnets. This material increases the additive strength of the separate magnets and directs the summed magnetic field through the planar surface of the abutted magnets. This allows a smaller magnet to oppose the gravitational and buoyant forces acting on the hole former 32 during the casting process. The magnet assembly 10 is therefore better able to retain the hole former 32 and the hanging bracket 30 in its stationary predetermined position.

As shown in Figure 4, the individual magnets in the magnet assembly 10 are positioned so that like polarities are adjacent one another, being separated by the pole pieces 14. In order to overcome the repulsive forces that the like poles have on each other, the individual magnets must be bonded to the adjacent pole pieces 14. This can be accomplished by any means known in the art, however for purposes of completeness, the magnets of the present embodiment are bonded to the pole pieces 14 with an epoxy. In another embodiment, the magnets and the pole pieces 14 can be held together by the metal casing 16, either by compressive force, or by the use of a cast in ridge, described infra.

The magnet casing 16 can be made from any material that is capable of retaining the disposed magnets, including metals, alloys, and plastics. The current embodiment utilizes a high-grade aluminum that can either be machined or molded into the desired casing shape. The magnet casing 16 has an interior that is

capable of receiving the disposed magnets. When the magnet casing 16 is machined, the inner wall 20 of the magnet casing 16 can be provided an inverse chamfer 22. When the disposed magnets are inserted into the machined casing, an epoxy 24 can be utilized in order to retain the magnets within the casing 16 interior. When an inverse chamfer 22 is provided, the epoxy 24 will fill the chamfered area that is not filled by the magnets. This creates a situation where the magnet/epoxy piece is larger at one end of the chamfered casing than is the opening into the interior of the casing 16. Thus, it is very difficult to remove the magnets from the casing 16 without fracturing the epoxy/magnet bonding.

When the casing 16 is cast molded around the disposed magnets, a magnet groove 26 can be employed along the disposed magnets to aide in the retention of magnets within the casing 16. This groove 26 is located around the perimeter of the disposed magnets, such that the cast material 28 fills the groove 26 during the casting process. Thus, once cast, the disposed magnets are virtually locked into place within the interior of the casing 16. This prevents the unwanted removal of the magnets from the casing 16. While the temperatures that are necessarily employed in the casting of the casing 16 have a detrimental effect on the magnetic strength of the disposed magnets, one of ordinary skill in the art would recognize this and make the necessary adjustments in the magnet size or composition to overcome this.

During the casting process, it is not uncommon for the casing 16 to become embedded in the casting material 28. While it is within the scope of the invention to use the coat the magnet assembly 10 with a releasing agent, an optional feature of the magnet assembly 10 is provided to further ease recovery of the magnet assembly 10. To overcome adhesion to the cast material 28, the casing 16 of the current invention can optionally include a disposable blister pack. This blister pack is an expendable covering that attaches itself to the exterior of the casing 16, thus preventing the casing 16 surface from coming into contact with, and adhering to the cast material 28.

The blister pack can be made from any suitable material, however plastic is preferred. The interior of the blister pack is contoured so that it substantially matches the shape of the outer surface of the magnet casing 16. This minimizes the amount of material need for the blister pack, and also prevents seepage of casting material 28 between the blister pack and the casing 16, which could make removal more difficult. The blister pack can be attached to the exterior of the casing 16 using any means known in the art including tape, glue, brackets and the like. Preferably, the blister pack "snaps" onto the casing 16, and is retained by the blister pack clasping around the body of the casing 16.

When the hole former 32 assembly is properly aligned within the mold assembly, an outer jacket is positioned concentrically around the inner mold. While the current embodiment describes this as a cylindrical shape, one skilled in the art would recognize that other shapes could be used, depending on the final application for the cast member. The outer jacket, similar to the inner mold form 34, can be composed of any acceptable material that is resistant to the casting material 28. Therefore, in the case of concrete casting, the outer jacket could be made of wood, fiberglass, metal, metal alloys, plastic, or any other material that one of ordinary skill in the art would recognize as suitable.

The outer jacket is aligned with the inner mold form 34 and the hole former 32 assembly so that the inner wall of the outer jacket is adjacent and flush with the hollow edge of the hole former assembly. This abutted arrangement of the hole former to the outer jacket is necessary to ensure that the cast hole penetrates the entirety of the cast member. The abutted arrangement also prevents the casting material 28 from flowing into the interior of the hole former 32 assembly, which would make removal of the hole former 32 from the cast member more difficult. When a knock-out assembly is used, the hole former 32 will only abut one of the inner walls or the outer jacket. This is utilized to make a thinner section of cast material 28.

The space between the outer jacket and the inner mold form 34 is filled with casting material 28. When the casting material 28 hardens, the cast is removed from the mold form. The magnet assembly 10, which is embedded in the cast material 28, can then be removed. To facilitate removal of the magnet assembly 10, a metal handle or other magnetically attractable member can be adhered to the magnet assembly 10. The magnetic attraction by the magnet assembly 10 to the metal handle is greater than the adhesive forces between the cast member and the magnet casing 16. One can then simply lift the magnet assembly 10 out of the cast material 28.

When a blister pack is utilized, removal of the magnet assembly 10 becomes even easier. A handle is magnetically adhered to the magnet as above. However, it is not necessary to fracture the casing/casting adhesion. The magnet assembly 10 simply "unsnaps" from the blister pack, leaving the disposable blister pack embedded in the final cast member.